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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHYLENE UREA DERIVATIVES AS RAF-KINASE INHIBITORS

(57) Abstract: The present invention relates to methylene urea derivatives of formula (I), the use of the compounds of formula (I) as inhibitors of raf-kinase, the use of the compounds of formula (I) for the manufacture of a pharmaceutical composition and a method of treatment, comprising administering said pharmaceutical composition to a patient.



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- (71) Applicant (for all designated States except US): MERCK PATENT GMBH [DE/DE]; Frankfurter Strasse 250, 64293 Darmstadt (DE).
- (72) Inventors; and
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- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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International Application No PCT/EP 03/11134

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 C07D213/68 C07D213/75 CO7D417/12

C. DOCUMENTS CONSIDERED TO BE RELEVANT

A61K31/44

C07D401/12 C07D413/12 A61K31/4427 A61P29/00

C07D409/12

Relevant to claim No.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 CO7D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, CHEM ABS Data, BEILSTEIN Data, WPI Data

Citation of document, with indication, where appropriate, of the relevant passages

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Υ	(G) 31 May 2001 (2001-05-31) see examples78-81 and claims 1,	11-15	1-32
X	WO 02/24679 A (SHIMADA MITSUYUK AG (DE); ZIEGELBAUER KARL B (DE Y) 28 March 2002 (2002-03-28)	I ; BAYER E); KORIYAMA	1-3,7,8, 10-15, 17-23, 26-28, 30-32
	see e.g. example 32-14 and claft 7, 9-15	ims 1-4, 6,	
		-/	
		Y Patent family members are listed	in annex
<u> </u>	ther documents are listed in the continuation of box C.	Λ .	
"A" docum	ategories of cited documents: nent defining the general state of the art which is not idered to be of particular relevance	"T" later document published after the Interpretation or priority date and not in conflict wit cited to understand the principle or to invention	h the application but heory underlying the
filing "L" docum which citati "O" docum other "P" docum	r document but published on or after the International date nent which may throw doubts on priority claim(s) or h is cited to establish the publication date of another on or other special reason (as specified) ment referring to an oral disclosure, use, exhibition or r means nent published prior to the international filing date but than the priority date claimed	 "X" document of particular relevance; the cannot be considered novel or canning involve an inventive step when the cannot be considered to involve an independent of particular relevance; the cannot be considered to involve an independent of the cannot be considered with one or ments, such combination being obvious in the art. "&" document member of the same pater 	ot be considered to locument is taken alone claimed invention nventive step when the nore other such docu-
Date of the	e actual completion of the international search	Date of mailing of the international se	earch report
	23 July 2004	18.08.2	004
Name and	d mailing address of the ISA European Patent Office, P.B. 5818 Patentiaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo ni, Fax: (+31–70) 340–3016	Authorized officer Traegler-Goeldel	, M
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		PCT/EP 03/11134
C.(Continua	ntion) DOCUMENTS CONSIDERED TO BE RELEVANT	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/062750 A (SCHERING CORP) 15 August 2002 (2002-08-15)	1-3,7, 10-15, 17-23, 26-28, 30-32
	see compound CU on p. 25, compound III on p. 45 and compound 33 page 70; claims 1,2,30,33-37	
X	EP 0 839 803 A (SS PHARMACEUTICAL CO) 6 May 1998 (1998-05-06)	1-3,7, 10-15, 19,20, 22,23, 26-28, 30-32
	claims 1-3,5,6; examples 1-36	
X	DE 199 47 457 A (AVENTIS PHARMA GMBH) 5 April 2001 (2001-04-05)	1-3,7, 10-15, 19,23, 26-28, 30-32
	claims 1-3; examples 5A,5B	
X	WO 02/12210 A (BERNARDON JEAN MICHEL; CLARY LAURENCE (FR); GALDERMA RES & DEV (FR) 14 February 2002 (2002-02-14)	1-3,7, 10-15, 17,19, 20, 26-28, 30-32
	claims 1,10,15,18; examples 9,10	
Υ	SMITH R A ET AL: "DISCOVERY OF HETEROCYCLIC UREAS AS A NEW CLASS OF RAF KINASE INHIBITORS: IDENTIFICATION OF A SECOND GENERATION LEAD BY A COMBINATORIAL CHEMISTRY APPROACH" BIOORGANIC & MEDICINAL CHEMISTRY LETTERS, OXFORD, GB, vol. 11, no. 20, 2001, pages 2775-2778, XP001118699 ISSN: 0960-894X see lead compound 89	1-32
Y	WO 02/062763 A (RIEDL BERND ;LOWINGER TIMOTHY B (JP); DUMAS JACQUES (US); RENICK J) 15 August 2002 (2002-08-15) tables 1-6, claims 1-33	1-32



C (Caption	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	101/21 03/11104
Category °		Relevant to claim No.
X	US 4 057 636 A (PETERSEN HANS JORGEN) 8 November 1977 (1977-11-08)	1,2,7, 10-15, 19,23, 26-28,31
	see the 5 benzylderivatives of table A and examples 37 and 57, its production and pharmacological activity	
X	US 5 441 984 A (HEATH, WILLIAM F., JR. ET AL) 15 August 1995 (1995-08-15)	1,2,7, 10-15, 19,23, 26-28,31
	see examples 6 and 10, its production and activity	
X,P	HOPKINS, THUTAM P. ET AL: "Solid-Phase Synthesis of Trisubsituted Guanidines" JOURNAL OF COMBINATORIAL CHEMISTRY, 4(2), 167-174 CODEN: JCCHFF; ISSN: 1520-4766, 2002, XP002289534 see compound with RN 409080-96-2 and its production	1-3, 30-32
X	WO 00/61561 A1 (SHIONOGI BIORESEARCH CORP., USA) 19 October 2000 (2000-10-19)	1,2,7, 10-15, 17,18, 21,22, 26-28, 30-32
	see inter alia many especially example 26, its production and activity	
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	see e.g. examples 14-16 and scheme on p. 16	
X	WO 95/18126 A1 (FUJISAWA PHARMACEUTICAL CO., LTD., JAPAN) 6 July 1995 (1995-07-06)	1,2,7, 10-15, 19,20, 22,23, 26-28
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		PCI/EP 03/11134		
	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	· · · · · · · · · · · · · · · · · · ·		
Category °	Citation of document, with Indication, where appropriate, of the relevant passages	Relevant to claim N	0.	
х	WO 01/57008 A1 (BASF AKTIENGESELLSCHAFT, GERMANY) 9 August 2001 (2001-08-09) see e.g. inter alia examples 24 and 26-31 and in combination with scheme II	1,2,7,8 10-15, 17,18, 20-22, 26-28,3	3,	
	and in combination with scheme II			
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Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)
This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:
Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
2. X Claims Nos.: 1-3, 7-32(part) because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically: see FURTHER INFORMATION sheet PCT/ISA/210
3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).
Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)
This International Searching Authority found multiple Inventions in this international application, as follows:
see additional sheet
1. As all required additional search fees were timely paid by the applicant, this international Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
Remark on Protest The additional search fees were accompanied by the applicant's protest. X No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1-3, 7-32(part)

Present claims 1 to 3, 7 to 32 relate to an extremely large number of possible compounds, processes for their production, compositions and methods. Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the compounds claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible.

Furthermore, the initial phase of the search revealed a very large number of documents relevant to the issue of novelty. So many documents were retrieved that it is impossible to determine which parts of the claim(s) may be said to define subject-matter for which protection might legitimately be sought (Article 6 PCT).

For these two reasons, a meaningful search over the whole breadth of the claims 1 to 3 and 7 to 32 is impossible. Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely the search has been restricted to the compounds of claim 4 to 6 and the claims depending thereon, but only as far as as the specified compounds of claims 4, 5 and 6 are concerned.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

International Application No PCT/EP 03/11134

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